



The Avalanche Gazette

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Editors Page

Welcome to the second issue of “The Avalanche Gazette”. This is a very busy time of year for everyone working with avalanches, and for a while I wasn’t sure how much would be submitted to assemble. But when the time came to put the issue together the material was there, and this issue is similar in length and quality to the first one, with a few improvements in the final product. (There will surely be more as this scientist/engineer continues to figure out the world of design!) Many thanks to all of these authors for taking time from their busy schedules to contribute to this general-readership publication.

This issue has been timed to coincide with the first CSAC Avalanche Awareness Week, February 17-25. Most of the articles focus on the need for basic awareness, whether this is through a survey of tour leaders and their strengths vs their weaknesses or through survival statistics.

There are several articles related to snowmobilers and avalanche safety, a big issue in North America. I had asked Darcy to consider submitting something, and then while the issue was coming together Lori sent a draft of her article, just a FYI (For Your Information) mail. I felt it had a lot of merit and suggested she permit us to include a version here. The issues of awareness and snowmobiling go beyond “sledders” avoiding avalanches and include the awareness of biases among professional educators and the awareness of the importance of all of us to work together for avalanche safety. Skiers and sledders need to learn to keep their disagreements on other issues (primarily environmental) from preventing them from working together where they do have a common interest.

New in this issue is the linking of URL’s (web addresses). We have been unable to make these appear like links (i.e. blue and underlined) so far due to some sort of software problem. However, anywhere there is a web-address written out it should be linked.

The policy on e-mail addresses has been not to include them unless the author either requests it or includes the e-mail within the text of the article. There are a couple reasons for this, and several options for reaching authors if you wish. Many people prefer not to get spam (junk e-mail) and this often comes from the “harvesting” of addresses off the web. It has also been an unfortunate reality at the CSAC that we receive a certain amount of “hate-mail”. While it is greatly outweighed by positive e-mail it is still discouraging when you are providing a service at a financial loss. Nobody who is contributing their time needs to be potentially subject to this abuse.

To contact authors whose e-mail is not explicitly given you can try any of three things. If you request it from us we will let you know how to contact them. Or you can go to the website of their organization and find them that way. Finally, to make a public response to an article you may submit a letter to the Gazette. We will publish all constructive letters along with a reply by the author.

We hope you enjoy this issue, we hope to have the next one ready in mid-April. Hopefully that one will include some articles related to climbing rather than snowmobiling, since spring avalanche incidents often involve climbers. We are also hoping to include incident summaries from more countries in the future. In this issue we have added Scotland, thanks to Blyth Wright of the SAIS.

Jim Frankenfield
Managing Editor

Two Avalanche Beacon Case Studies

Franz Kröll, ORTOVOX sportartikel gmbh

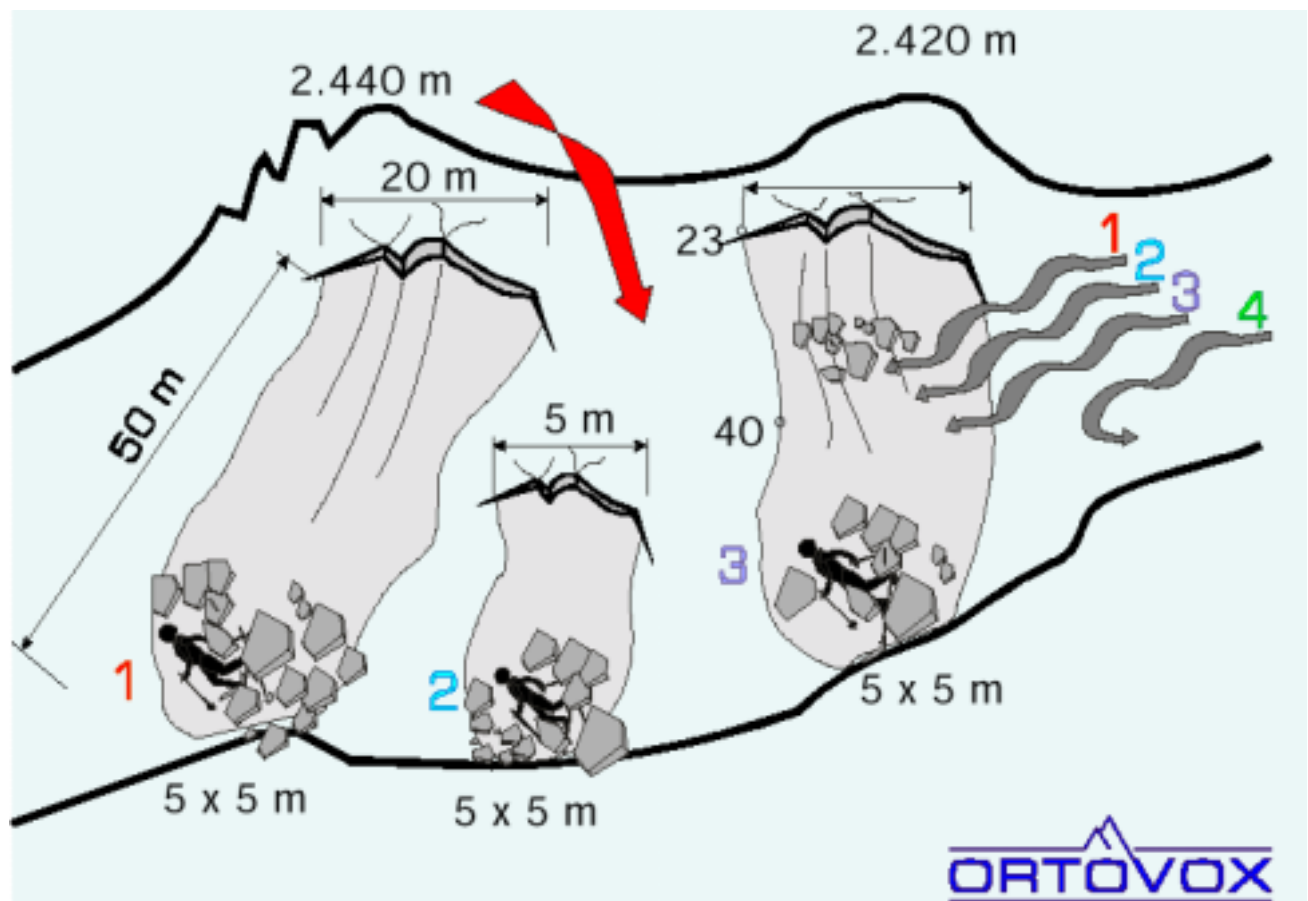
How important is the “transmit-receive” switch in an avalanche accident?

On 29th of December 1991 a group of 3 clients, guided by a very experienced UIAGM guide, walked up to Heidelberger Scharte (Central Alps, Silvretta; between Tyrol and Switzerland). This was the first day of their back country week. Conditions were not really bad, but also not really good: step 3 of the avalanche forecast, *considerable*. The chosen route is taken often. The area is open until the beginning of December. The snowpack was 1,6 meter deep; one third depth hoar, one third small grains, one third wind loaded (two days old snow; with some tension).

On the way back, the group skied together with a distance of about 20 m between No. 1, No. 2 and No. 3. No. 4 skied round about 50 m behind. The first 3 skiers realized that descending straight into the depression meant walking up the other side. So the guide decided to ski the slope diagonal to avoid walking up a few meters. While skiing this slope diagonally they triggered 3 small avalanches. Every skier was buried under a small amount of debris (5 x 5 meter). They were buried by not more than 20 to 30 cm.

The fourth person, arriving later, realized that there were three tracks leading into the slope and no track leads out. She took her beacon from the neck and started searching. After about 15 minutes she got no signal, skied down to the hut and asked for help. Arriving round about one hour after the triggering of the avalanche, the rescuer got the three signals immediately, pin-pointed the three persons, and dug them out in less than 3 minutes. All three skiers died due to the late rescue.

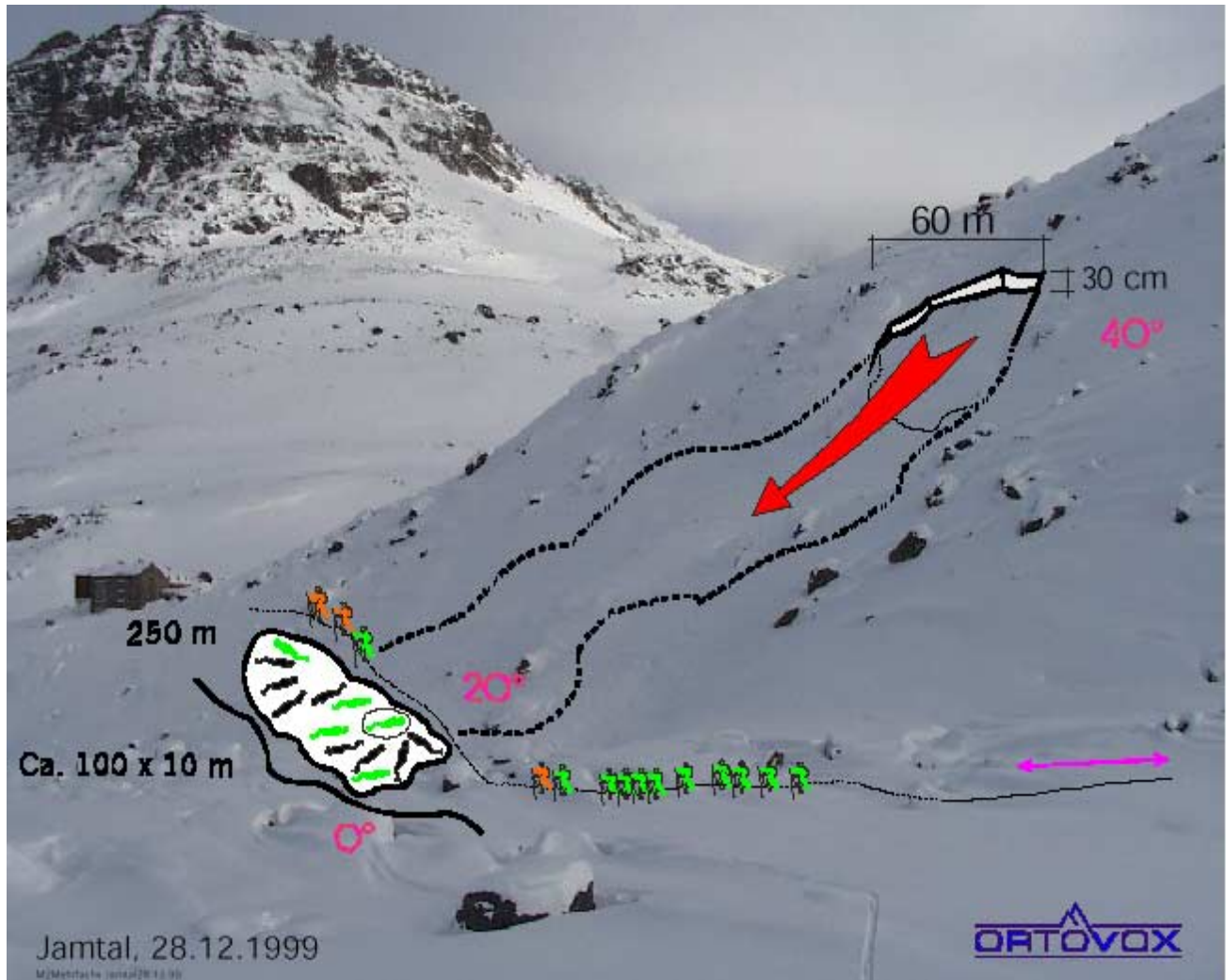
The surviving person could not get a signal, because she was not able to switch from transmitting to receiving mode. Complicated maneuvers for switching from transmitting into receiving mode will lead again into a disaster!



How important is to be trained in a multiple burial situation?

This slab avalanche accident happened on 28th of December 1999 in Jamtal, near the Jamtal hut (Central Alps, western Tyrol). Thirteen persons were caught by a small slab avalanche, transported between 5 and 20 meters, and buried about 2 meters deep each. The avalanche forecast for this day was step 3 – 4 (considerable to high); very little snow, heavy wind.

This might be one of the worst situations a rescuer could imagine. 13 signals within an area about 50 meters, some of the victims are as close as 2 - 3 meters. The rescuer managed this situation: they could figure out a precise pin point search with their beacons and they could save 4 lives, 9 person were killed by the lack of oxygen. The rescue was done within 65 minutes.



Conclusions

For the new ORTOVOX m2 we developed a well-considered, simple, fast and safe “transmit-receive” switch. We are sure that this innovative device will save lives in the future! ORTOVOX also develops and distributes avalanche transceivers with the longest possible range for a fast coarse search, for a fast fine search and for the most precise pin point search.

(Editors Note: Regardless of what type of beacon you may own please be sure to familiarize yourself fully with its operation. The ultimate responsibility for a successful rescue lies not with any equipment manufacturer but with the individual – are you prepared for this responsibility?)

Austrian Guides Legal Issue (News Brief)

During Christmas of 1999, a group of 14 international ski mountaineers in the Austrian Alps triggered an avalanche that killed 9 skiers on the tour. The three certified mountain guides who led the group were then sued in an Austrian Court for negligent liability for the accident by the surviving family members. The guides' professional fate was held in probate of court for almost one year until a final decision was made.

In that time period each guide was sued individually and their independent organizations were not held responsible at all. Jack Smithback, the *NSPS European Avalanche Advisor* and Patrol Director for the *Garmish Mountain Patrol* in Garmish, Germany, stated the following in regards to this case, "Ski resorts worldwide need to keep abreast of these risk management issues because they can and do happen in and out of their boundaries of control due to many guides offering their services within various resorts. Too often the negligence of others to read nature's billboards or just fate can pull a resort into a legal battle because they represent the greater financial holdings to go after."

Luckily, in this situation the Austrian court system could not penalize anyone beyond the guides in question due to their groups' remote out-of-bounds location. Just days prior to Christmas 2000 and (after great deliberation) the 3 guides were acquitted and not held liable for the deaths. This outcome has caused a new evaluation of guiding in Europe and its practices even though some factors in avalanche risk assessment are not easily seen, there will always be a risk in some area no matter the mountain.

By: Dr. Steven A. Reinfurt
AAAP Avalanche Specialist
Garmish Mountain Patrol

Editors Note -

The incident used as a second case study by Franz Kroll on the previous page is the same as the one mentioned above. This incident sparked a great deal of discussion in Europe. There is more specific information on the web in at least two locations:

The CSAC Avalanche Center file: <http://www.csac.org/Incidents/1999-00/19991228-Austria.html>

A site maintained by Jan Rehm : <http://www.geocities.com/janrehm/>

The second site is primarily in German but may be translated using Alta Vista:
<http://babelfish.altavista.com/translate.dyn>

GLACIER COUNTRY AVALANCHE CENTER

&

GLACIER COUNTRY AVALANCHE CENTER, INCORPORATED

BY:

TED STEINER,

EXECUTIVE DIRECTOR,

GLACIER COUNTRY AVALANCHE CENTER, INCORPORATED

Glacier Country Avalanche Center Introduction:

Glacier Country Avalanche Center, Incorporated received its christening in the fall of 1995 when it was realized local government would terminate financial support for the pre existing avalanche advisory system.

Glacier Country Avalanche Center, Incorporated (GCAC, Inc.) is a Montana State registered non-profit organization with its own Articles of Incorporation and By Laws. It is as a “friends of” group for the Glacier Country Avalanche Center (GCAC) and is now represented by nine (9) Board of Directors with diverse backgrounds somehow related to snow. Since its inception, GCAC, Inc. has grown into an incredibly successful organization with a specific mission to promote avalanche safety/ awareness in Northwest Montana and raise funds for the Glacier Country Avalanche Center.

All funds raised by GCAC, Inc. are contributed through private donations, corporate sponsors, grant programs, and an annual fundraiser. All contributed monies to GCAC, Inc. go specifically toward community oriented avalanche education and help fund the Glacier Country Avalanche Center avalanche advisory. All monetary donations are tax-deductible contributions.

In turn, the Glacier Country Avalanche Center functions as a partnership between GCAC, Inc., Flathead National Forest, Kootenai National Forest, Glacier National Park, and the National Weather Service. Together, these government entities operate to issue a bi-weekly avalanche advisory for eight mountain ranges that span approximately 10,000 square miles.

Glacier Country Avalanche Center, Incorporated Financial Contributions:

- Private donations: Private donations toward GCAC, Inc occur in many different forms: products, services, volunteered time and, of course, money. Most monetary donations usually accompany a sponsored event such as a slide show by a local mountaineer or skier. However, GCAC, Inc has also had funds donated toward the program through private memorial contributions.
- Corporate sponsors: GCAC, Inc.’s corporate sponsors include local businesses that are in some way involved with winter recreation or operations. Examples included local outdoor retailers, ski areas, and lodges. We also receive a contribution from a local winter search and rescue group, the Flathead Nordic Ski Patrol.
- Grants: GCAC, Inc. has been fortunate enough to receive financial support from the State of Montana Snowmobile Safety Program, Kalispell Regional Hospital, Burlington-Northern Santa-Fe Railway, and participate in a matching grant from the National Forest Foundation.
- Fundraiser: For the past two years, Glacier Country Avalanche Center, Incorporated has hosted an annual fundraiser, the GCAC “Snowball,” which includes a raffle, dinner, silent auction, and live music. This event has been incredibly fun and generated substantial funds.

Glacier Country Avalanche Center Program History

Glacier Country Avalanche Center Incorporated and Glacier Country Avalanche Center came to life, with the demise of the Northwest Montana Avalanche Advisory System (NMAAS). The NMAAS was initiated in 1978 with a specific mission to publish a weekly avalanche advisory for the Flathead region. Similar to GCAC, NMAAS had been a cooperative effort

between Flathead County, Flathead National Forest, Kootenai National Forest, Glacier National Park, and the National Weather Service. Financial Support for NMAAS was provided by Flathead County.

In 1983, Stan Bones became involved with the NMAASS program as an avalanche specialist for the Flathead National Forest. As the Forest's avalanche specialist, Stan worked in cooperation with Flathead County's Disaster and Emergency Services. Stan's Program responsibilities revolved around organizing and teaching public avalanche education courses as well as issuing the NMAAS avalanche advisory. The NMAAS program continued until 1995 when Flathead County discontinued financial support.

In the fall of 1995, a conglomeration of three entrepreneurs (and friends), Stan Bones, Don Scharfe, and Blase Reardon brainstormed the idea of the Glacier Country Avalanche Center. Stan was familiar with the previous avalanche program from his avalanche specialist position. Don Scharfe, owner of a local mountaineering shop and also an avid skier was keyed into the outdoor community. Blase Reardon, also an avid backcountry type, had just moved to the Flathead Valley from Utah where he had been on the fundraising committee with the successful "friends of" Utah Avalanche Center. Blase was familiar with the organization of the "friends of" group as well as successful fund raising projects.

The new Glacier Country Avalanche Center hit the slopes with new enthusiasm and program possibilities. The Glacier Country Avalanche Center rallied with financial support from GCAC, Inc. GCAC, Inc.'s financial support allowed for the continuance of one avalanche advisory each week and increased avalanche education opportunities.

By 1997, financial assistance from GCAC, Inc. allowed a second avalanche advisory to be added to GCAC's avalanche program. Advisories were now issued on Tuesday and Friday of each week. In 1998, the addition of a second volunteer avalanche specialist, Blase Reardon, allowed the second avalanche advisory to continue while increasing GCAC avalanche education opportunities to the public.

For the 1999/2000 operating season, Blase was brought onto the Flathead National Forest as a seasonal avalanche specialist. By the end of the 1999-2000 season, a third avalanche advisory was being issued on Saturday mornings, and public attendance of GCAC avalanche education classes had increased from 632 in 1995/96 to 2116. Also, the 1999/2000 season represented the inaugural GCAC/ GCAC Inc. college level internship program. The internship program was enacted to benefit college students interested in snow science.

Glacier Country Avalanche Center's Current Program:

GCAC, INC.

Glacier Country Avalanche Center, Incorporated continues to stay very busy. In fact, GCAC, Inc is so busy, the Board of Directors voted last month to hire an Executive Director. Following the Board's vote, I was brought on as GCAC, Inc.'s first-ever Executive Director.

GCAC, Inc. determined it would serve the best interest of the public to hire a part-time Executive Director to work as a liaison between different government/private entities, maintain the GCAC website, oversee avalanche educational programs, and administer funding events or additional funding opportunities.

Also, GCAC, Inc. has entered its third season of conducting the "Trailhead Program." The focus of this program is to visit with snowmobilers each weekend at various trailheads to visit and discuss avalanche safety, avalanche education opportunities, and avalanche rescue equipment. New this season for GCAC and GCAC, Inc. is a new domain name: www.glacieravalanche.org

GCAC:

The Glacier Country Avalanche Center went through a major transition this season as the Forest Supervisor removed Blase Reardon from the Flathead National Forest's avalanche program. Unfortunately, Flathead National Forest is suffering a budget deficit and is cutting all seasonal employees from the Forest that are not essential to Forest operations. A Forest permanent employee, Tony Willits, has filled Blase's position as an avalanche specialist. Stan Bones continues as the

Forest's lead Avalanche Specialist. The GCAC program continues to operate as a partnership between GCAC, Inc., Flathead National Forest, Kootenai National Forest, Glacier National Park, and the National Weather Service. GCAC is issuing two advisories a week this season and is conducting various avalanche education classes around Northwest Montana. As of now, Flathead National Forest is not participating in the GCAC internship program and has nullified the third weekly avalanche advisory with the existing Avalanche Program budget.

If you have any further questions or comments about the GCAC, Inc./ GCAC program, please do not hesitate to contact me. I would love to hear from you. I can be reached at ted.steiner@glacieravalanche.org or you can call me at: (406) 863-9624 anytime.

Thanks for your interest!

Cheers,

Ted.

This article is available in its entirety on the web, in both English and German. While the full article is a bit long and slightly technical for this forum the abstract and conclusion are relevant to many of our readers. For those who would like to read the full article the URL is included below the authors byline. - Ed.

AVALANCHE RESCUE SYSTEMS IN SWITZERLAND: EXPERIENCE AND LIMITATIONS
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<http://www.slf.ch/info/unfallstatistiken.pdf>

ABSTRACT: The current study is concerned with the influence of transceiver and avalanche balloon devices on the survival probability of people caught by avalanches. From 1936 to 1999, 1592 people have been killed by avalanches in Switzerland. The data of avalanche incidents in the years 1980 to 1999 has been extensively analyzed. These investigations result in a mortality rate of completely buried people of about 50%. Considering the total

LAWINENUNFÄLLE IN DEN SCHWEIZER ALPEN - EINE STATISTISCHE ZUSAMMENSTELLUNG MIT DEN SCHWERPUNKTEN VERSCHÜTTUNG, RETTUNGSMETHODEN UND RETTUNGSGERÄTE

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<http://www.slf.ch/info/unfallstatistik-de.pdf>

ZUSAMMENFASSUNG: Die vorliegende Studie gibt einen Überblick über die Lawinenunfall-Statistik in der Schweiz und untersucht den Einfluss von Lawinenverschütteten-Suchgeräten (LVS) und des Lawinen-Airbags auf die Überlebenschance von Personen, welche im freien Gelände durch Lawinen verschüttet worden waren. Die Arbeit basiert auf Zahlen, die durch das Eidg. Institut für Schnee- und Lawinenforschung (SLF) in den Jahren 1937 – 1999 gesammelt und bearbeitet worden sind. In diesem Zeitraum sind in der Schweiz 1592 Personen in Lawinen ums Leben gekommen. Näher studiert wurde der Zeitraum von 1980 – 1999. Auf Grund dieser Untersuchungen kann gesagt werden, dass die Letalität bei allen von Lawinen erfassten Personen weniger als 13% beträgt. Bei Ganzverschüttungen hingegen beträgt die Letalität rund 50%. Die besten Überlebenschancen haben Personen, welche nicht ganz verschüttet sind oder bei welchen zumindest ein Ausrüstungs- oder Körperteil an der Lawinenoberfläche sichtbar ist. Während die mediane Verschüttungszeit der Überlebenden rund 11 Minuten betrug, war sie bei den tot geborgenen Personen mit 120 Minuten markant höher. Aus diesen Gründen ist eine Reduktion der Verschüttungszeit durch eine schnelle LVS-Suche oder, noch besser, das Verhindern einer Verschüttung durch den Einsatz eines Lawinen-Airbags anzustreben, wenn man die Überlebenschance von Lawinopfern erhöhen will. Die Zahlen der vorliegenden Studie bestätigen diese Botschaft.

number of people caught by an avalanche, the mortality rate is approximately 13%. If people are not completely buried, or if at least parts of their body or equipment are visible on the surface of the avalanche debris, they have the best chances of survival. There is a strong correlation between mean burial time and the probability to survive an avalanche incident: The mean burial time of people who were completely buried and survived the avalanche incident is about 11 minutes, where the mean burial time of people killed by an avalanche is 120 minutes. For this reason, a reduction of burial time by fast transceiver search or even avoiding burial by using an avalanche airbag device has to be achieved to increase the survival probability. The results of the current work confirm this statement.

CONCLUSIONS: If one is caught by an avalanche one has the greatest chances of survival if one is not, or only partly, buried. In the case of total burial, the survival chances are best if parts of the body or equipment is visible on the avalanche surface. Companion help is very effective. In latter years, the more frequent success of transceiver search has contributed to a positive development. The favorable development in organized rescue actions can be explained by the broad distribution of modern communication technology (mobile phones, radio sets) and by fast and professional rescue actions (helicopter, rescue services). Currently, out of the proven technical devices, the avalanche airbag provides the greatest chances of survival in avalanche incident. However, despite all positive developments and modern technical devices, one must never tolerate any avalanche incident – if because of the enormous risk of severe injury.

SCHLUSSFOLGERUNGEN: Die Anzahl der Lawinenopfer in den Bereichen „Verkehrswege“ und „Gebäude“ ist significant rückläufig. Der Schwerpunkt der Lawinenunfälle der vergangenen Jahre lag in der Kategorie „freies Gelände“. Innerhalb dieses Bereiches zeichnet sich eine Verlagerung aus der Kategorie „Touren“ in die Kategorie „Varianten“ ab. Die Bemühungen in der Ausbildung und bei der Information von Touristen, insbesondere von Variantenfahrern, sollten daher intensiviert werden, wenn man einen Rückgang von Lawinenunfällen erreichen will.

Das Risiko, in einer Lawine schwere Verletzungen zu erleiden und an diesen möglicherweise zu sterben, ist grösser, als bis anhin angenommen. Daher darf trotz aller positiver Entwicklungen und modernster Rettungsgeräte ein Lawinenunfall niemals bewusst in Kauf genommen werden.

Mindestens alle 5 Jahre muss im freien Gelände mit einem Lawinenunfall mit 5 oder mehr Todesopfern gerechnet werden. Die Verteilung der Anzahl der Todesopfer pro Unfall ist zufällig.

Die Verteilung der Verschüttungstiefen zeigt, dass die im Abschnitt 6.2 beschriebene Wirkungsweise des Lawinen-Airbags auch bei Verschütteten ohne aufgeblähte Lawinenballons einen gewissen Effekt hat.

Die Letalität bei allen von Lawinen erfassten Personen wird auf höchstens 13%, die Letalität im Falle einer Ganzverschüttung auf rund 50% geschätzt.

Wird man von einer Lawine erfasst, hat man die grösste Überlebenschance, wenn man nicht oder nur teilweise verschüttet wird. Bei Ganzverschütteten ist die Überlebenschance am grössten, wenn Körper- oder Ausrüstungsteile an der Lawinenoberfläche sichtbar sind. Kameradenhilfe ist sehr effizient. Hier haben in den letzten Jahren vor allem die häufigeren Erfolge mit LVS-Geräten zu einer günstigen Entwicklung beigetragen.

Die positive Entwicklung bei der organisierten Rettung lässt sich vor allem durch die gute Verbreitung moderner Kommunikationsmittel (Handy, Funkgerät) und durch schnelle (Helikopter, Pistendienste) und professionelle Rettung erklären. Von allen bewährten technischen Hilfsmitteln bietet aber der Lawinen-Airbag derzeit die grössten Möglichkeiten, einen Lawinenunfall zu überleben.

Untersuchung über den lawinenkundlichen Wissenstand bei Tourenführern

Investigation on the avalanche hazard knowledge status of tour leaders

By Walter Stefan Würtl, University of Innsbruck, Austria

Summary of report

In spring 1999 the level of avalanche training of tour guides inside the OEAV (Austrian alpine association) was raised by means of a written questionnaire. It concerns an examination in a so far relatively unexplored investigation field. Scientifically, the available paper can be assigned to risk research and thus to Perceptual Geography. A total of 160 questionnaires (133 men and 27 women) were analyzed.

On the average (over many years) 25 persons are killed by avalanches in Austria each winter. The majority of the avalanche victims are definitely those who die in the free ski area. (i.e. outside ski area or ski run boundaries – ed.) This survey shows the strong and the weak points of the tour guides' training level. It is necessary to mention that this type of survey is not suitable for analyzing the whole situation in great detail.

Generally, the tour guides of the OEAV are very well equipped and also have enough practice with safety equipment. Weather forecasts and avalanche reports are preferentially consulted for planning a tour, whereby one trusts the quality of these sources. The most popular media for information gathering are television and telephone (tape recording).

The processes of nature are not understood by all those surveyed (unfortunately); this applies above all for depth hoar formations.

On the whole, the tour guides' behavior is adapted to the situations. Their estimation of the risk of being buried by an avalanche comes to 0,05%. The most frequently given reasons for avalanche accidents are inexperience and misjudgment as well as ignorance and stupidity. Basically, the investigation shows a picture of great inhomogeneity in the tour guides' level of training: very well trained and committed leaders on the one hand, but badly informed guides on the other hand.

The shown educational gaps should by no means to be regarded as criticism but just as a suggestion for further consistent improvement of the training, which is anyway already quite good.

Comparison with the inquiry 1990

[Editors Note – This section refers to a previous survey which was done by Peter Hoeller in 1990. While the above summary was submitted to us in English this section was submitted in German. Since the first part is only in English this part has been translated using Alta Vista to keep the entire article in one language.]

Although with the survey of 1990 no particular group was targeted, it is worth noting that the results are mostly comparable if nevertheless limited.

Than 1990 the area equipment or VS device is substantially better failed. Only if 55% of the asked ones practiced each winter season ago at that time, then practice of route leader inside 97.5% the mindestes once, on average even almost three times per season. If a VS device gave 1990 still 44% of the asked ones a feeling of the security, then there is 1999 “ only “ still approximately 35%, to which applies.

The shovel applies already for many years as a fixed constituent of the standard equipment, since already in 1990 97% had one. With 94% one can still assume also today that almost all are aware of the importance of this article of equipment.

Concerning knowledge of the structure of the winter snowpack there was (unfortunately) not much change. If it was around a third in 1990 which did not know in sufficient measure about the processes in the snowpack, there is nevertheless with available questioning still approximately 25%, which cannot correctly arrange the fundamental operational (developmental) sequence (of the snowpack).

It was not at that time well-known the asked one that the most dangerous exposures were situated in the northern half showed, this questioning that there is very probably a consciousness over this source of danger. However it must be again marked that the east slopes are not more dangerous in all regions than the west slopes. The main wind direction plays thereby a crucial role with which the importance of the observation of the weather process becomes clear. The effect of changes of temperature on the avalanche danger was 1990 for 31% of the asked ones a mystery. The number of those positive, the one cooling period in the high winter are however also 1999 consider still substantially too high (21%).

Snowmobilers and Avalanche Awareness

Comments by Jim Frankenfield, Managing Editor

There is often a tendency among skiers and other non-sledders to joke about the perceived inability of snowmobilers to grasp the basics of avalanche awareness. This condescending attitude is not only inaccurate but also counter-productive to the common interest in avalanche safety.

Many of the simplest bottom-line tips aimed at sledders today are really no different than those aimed at any other user group. If it appears that these basics are not reaching sledders we need to consider the reasons why. First of all sledders have not been getting into avalanche terrain with so much frequency until fairly recently. Skiers and climbers have been targeted for avalanche safety for significantly longer than sledders. Secondly, because of this there are still a great many more educators who are not sledders than the number which are. Finally, sledders constitute a very large user-group and the number of people to reach is very high.

There is also a perception that certain sledding activities (high-marking, in particular) are inherently foolish. If it is foolish to ride a sled up a steep slope it would seem equally foolish to ski down a steep slope or to climb on or below a steep slope. Yet we have never told skiers or climbers not to do these things, just to be aware of the risks and to be able to assess the current hazard.

Whatever other issues sledders and others may disagree on, we all have a common interest in avalanche safety. Education and information services in the US cost anywhere from \$20,000 for smaller organizations to almost \$250,000 for the Forest Service center in Seattle (annually). Funding and support is hard to maintain and everyone will be best served by working together.

WHAT'S WRONG WITH THIS STORY?

Lori Zacaruk; Zac's Tracs - Black Diamond, Alberta, Canada - zacs@cadvision.com

The term 'awareness' could not be more appropriate when searching for a method to reduce recreational avalanche fatalities. I believe that simple awareness of our surroundings and the impact of our actions while in the backcountry is the 'biggest bang for our educational buck'. "What is the worst that can happen in this area? With this in mind, what is the best way to proceed?" Sledders especially, cover so much terrain in one day that it is unrealistic to expect they will dig a snowpit before deciding whether or not to climb each particular hill. How reliable is the information even if they do dig a pit? Even experts cannot completely guarantee safety of a slope after analyzing the results of a snowpit.

Obviously a basis is needed in terminology, terrain, terrain traps and snow science in order to identify proper habits and the reasoning behind them. Self rescue is also a key component of any introductory course. It is just that if people only retain a percentage of all the material that they are exposed to, I believe that safe travel habits are the most important. Let's keep them from getting caught in the first place or at least reduce the numbers exposed. Avalanche terrain travel habits are, like any other habit, difficult to break. Peer pressure and other 'human factors' are very strong forces. The hurdle is to succeed in arming the vast majority of backcountry users with at least the basics in terrain awareness and travel habits so they 'buy in' to the program. Once everyone is 'thinking the same think' and individuals are no longer having to coax groups of peers to follow safe practices, recreation related avalanche incidences should decrease.

The following story is all in fun. It is intended to be a lighthearted view of “what not to do”, highlighting many of the poor travel habits of snowmobilers. Although it is somewhat exaggerated, I am sure most sledders can relate to it. Sledders with even a minimal level of awareness have progressed past most of these habits, but I have witnessed or am guilty of every one of the following scenarios. (Other than jokes over which sled was stuck and which one blew up...), I would enjoy your feedback. Are there some key habits that I missed? For fellow sledders, does this sound familiar??!

The group gets to the staging area the day after a big snowfall... “Right on!! Three feet of fresh powder and sunny skies!”¹ Eight to ten guys are raring to get to the hills.² Most of them have the gear.³ (few have actually practiced with it, even fewer have taken some form of training. They’ve all watched the Powder Bound 2 video and saw the avalanche and companion rescue of the film group with no gear, that counts... doesn’t it??!)

The only group check done before heading out is confirmation that they have enough extra gas packed for the way home.⁴ (They don’t always fill to the top and may even have changed out the stock fuel tank as serious climbers don’t want the extra weight when climbing). On the trail there is no time for looking up and around for visible signs of stability⁵ as they are traveling as fast as possible to “skip across the tops” of the washboard ruts on the ungroomed trails. If the trail is groomed, they are traveling fast to “open her up and see what she can do”. Many modifications are tested and tweaked during the day until the rider feels they have their sled “tuned”. The time taken to modify and correctly tune varies with the experience of the rider and mechanic and the depth of their pocketbook. Some guys never quit! Competition⁶, although in fun, is pretty fierce, especially between the four main brands: Arctic Cat, Polaris, Skidoo and Yamaha.

In this race for the hills, the focus is on the taillight in front.⁷ If the riders are really talented they may ride this quickly while checking along the trail for little areas of fresh snow in order to dart off and play in the powder. Those that do dart off, hope that someone on the main trail notices where they disappeared, just in case they get really stuck or breakdown.⁸ Some guys have had to wait quite awhile before their group even noticed that they were missing and came back looking for them.

It probably doesn’t matter whether anyone pays attention to fresh avalanche debris, no one made up an alternative game plan for the day anyway.⁹ “Besides, it’s not going to happen to us.” “I’ll just ride it out even if one does start.” “If it’s my time it’s my time, you know, it’s just fate.” “If we’re going to play the game we’ll just have to take the chance.” are some comments. “Take a course??! Learn some skills to better the odds? What?! And give up a good riding weekend?! Maybe next season.”¹⁰

Many trails crossed through avalanche paths but who noticed them? The only reason to group up and have a chat while on the trail is to wait for the slow guys to catch up, have a smoke, pull out the guy breaking trail, or share some interesting thing you or your sled just did.¹¹

OK, we are now at the hill, parked in the avalanche track (usually the fire for lunch is in the runout zone, out of the wind and near some deadfall). No one pays attention to the creek bed or the drop off at the bottom of the slope.¹² If they are lucky they’ve parked on a little knoll.¹³ “That’s safe right??! The gully we’re climbing channels off to the side a bit.” If anyone is brave enough to speak out about the choice of terrain for climbing or watching they are ignored or dismissed as a worrier, a whiner or “not that girl again? Who brings her along anyway?!”¹⁴

There go two guys up the hill,¹⁵ right up the center,¹⁶ headed for the rocks,¹⁷ until either the slope or the snow conditions overcome the power or traction of the sled (or the nerve of the rider!). They turn out (head back down) and hold on for the scary part of the ride. Hopefully there are not many terrain features, trees, ruts, or rocks on the straight line down. There is much less control and ability to maneuver on the way down.

Meanwhile, the rest of the group is getting ready to make their pass. Backpacks, loaded with their survival gear, and sled hoods may be coming off.¹⁸ (This stuff weighs too much and hoods are very expensive to replace in the event that you don’t stay track side down). Of those that have already taken a pass, they might be relating the

experience to their buddies, checking their spark plugs for a nice even burn, making adjustments to their clutching, rejetting... in any case their sleds may be disabled and they aren't necessarily watching the guys on the hill.¹⁹ (Unless you are the guy that left the highest mark on the hill, then you are watching to see if the next guy is using your packed track to get higher or if he is making his own trail.)

Another couple guys head up. One guy digs down and really gets stuck. After everyone stops laughing and pointing.. (all the Skidoo, Polaris, oh ya.. and the few guys on the heavy 800 Cats..., will make nasty jokes if it is a Yamaha stuck. Any combination of the above will start a good BS session.) someone will be the hero, or the good friend, and head up to help out his buddy.¹⁵ (The stuck guy might be the one with the keys to the truck or the beer fridge back at the hotel.) It's way too far to walk up, so if the helpful buddy thinks he can stop on the hill, he'll highmark around the stuck guy a couple times before stopping to give him a hand.²⁰ If it is too steep to safely park and the helper really wants to show off he might double up another guy and carry him up the slope. The passenger jumps off the back of the sled to give the stuck Mountain Max a hand, and the Summit that doubled him up now highmarks above both guys now sitting on the hill.

Special note: If it is your wife or girlfriend stuck on the hill, you have to go and help pull her out, no matter how dangerous the reported avalanche conditions may be. It is well worth the risk, as life wouldn't be worth living if you made her fight with the sled while you and the rest of the guys sat and watched.

Down at the bottom sleds are parked in a disarray. Unless they have reverse, not everyone has a clear path out.²¹ (Few have reverse as that would add a few pounds to the weight of the sled and lightweight components are every climber's dream. Power to weight ratio is the key. Some modifications are referred to in "dollars per pound". Horsepower modifications are just referred to as "dollars, dollars, and more dollars". (Can you tell that I get to see the credit card statement!?))

All sleds are set up with kill switches in case of the throttle sticking open or some other calamity. Kill switches, however, are not your friend in avalanche terrain. Obviously, in the off position, the sled turns over but will not fire.¹⁹ In spite of this well known fact, it happens all the time. Guys will forget and pull over their sleds a few times before realizing that the button is down...valuable seconds lost in a panic situation.

So, now it is 4:00pm, time to head back to the trucks, but, "we drove so far to get here lets just take one last poke at the hill."²² It is getting a little warm out so maybe the jacket and gloves come off.²³ At least at this point you can see who knows how to properly wear their transceiver, who forgot to put theirs on, and who felt the priority was modifications or clothing before safety.³ Too bad that in avalanche safety one guy's poor choice of priorities so greatly impacts the safety of the rest of his riding group.

The leader, often the guy with the best sled, has had enough, so now it is time to go. "Last one to the truck buys the beer!" And so, the race out is even faster than the trip in.¹⁰ The guys out in front have their throttles pinned and they don't look back until they're at the trucks, loaded, with their "after a great ride beer", in their hand.²⁴ It is starting to get dark now, and finally the rest of the group arrives, towing the Arctic Cat at nearly road speed.²⁵ "That is the second engine he has blown this season. Who's jetting that thing?!! It must be the dealer. They don't seem to know anything about mountain modifications. He was talking about getting a beacon next week but if he wants to keep sledding he better buy himself a set of EGTs." (Exhaust Gas Temperature sensors.)

"Well once again we've made it out to the trucks alive. Won't our families be happy to see us safe and sound. It just helps reinforce that I may as well put the hundred or so dollars into a new lightweight seat rather than sign up for that Avalanche Course my wife has been bugging me to take."

Footnotes - how many did you identify? If you're not a sledder, what are the corresponding issues in your sport?

¹ Let the snowpack stabilize after a big snowfall or wind event

² Choose a group size that is small enough to easily manage yet large enough to be effective in a survival situation.

³ At minimum: transceiver, shovel, & probe.

⁴ At trailhead - beacon check, headcount, designate leader and tail, confirm safe travel habits and reaffirm or adjust trip plan.

- ⁵ Be aware of conditions enroute and factor each new piece of information into your trip plan.
- ⁶ Be aware of ego or other 'human factors' and their impact on rational decision-making.
- ⁷ Be aware of your surroundings and significant terrain features. Use route selection to avoid or minimize exposure to dangerous areas.
- ⁸ Keep everyone within visual range. Do not travel alone.
- ⁹ Have an alternative route chosen before heading out. 'No go' must always be an option.
- ¹⁰ Mountain rules make no allowances for lack of knowledge.
- ¹¹ Agree on a signal and appropriate group management when traveling through avalanche terrain.
- ¹² Choose terrain with features that minimize chance of injury or depth of burial.
- ¹³ Park in safe zones. Identify and be prepared to escape to safer zones. Remember that you must maintain visual contact with the individual exposed to danger.
- ¹⁴ Respect opinions of all group members.
- ¹⁵ One person exposed to danger at a time. Limit the amount of load on the slope.
- ¹⁶ 'Test' the slope with a few fast passes across the slope (like a rainbow) before committing yourself to a 'centerpunching' the slope.
- ¹⁷ Identify and avoid weak zones within the snowpack.
- ¹⁸ Understand the pro's and con's of keeping or releasing gear such as backpacks and helmets.
- ¹⁹ Stay alert, with your sled prepared to escape to safe zones.
- ²⁰ Avoid traveling above others.
- ²¹ Keep your escape route unobstructed.
- ²² Rational decision-making may be pressured by impending darkness, inclement weather, or other negative conditions.
- ²³ Understand the implications of changing weather conditions on avalanche hazard.
- ²⁴ At least they saved it for after the trip!! (The designated drivers have to settle for pop.)
- ²⁵ Do not let your guard down. Backcountry rules are in effect until you are back at home.

[Any footnote problems remaining are from Word/Pagemaker difficulties and not the author - Ed.]

Awareness, User/Activity Groups, and Snowmobilers

An article for backcountry users

Darcy Svederus; SnowTec Services, Canada

The Backcountry Experience

The people who venture into the backcountry every season almost always have one thing in common. Which is that they go to experience, again and again, the sheer beauty of the landscape. They go to escape from everyday life.

What many don't see or understand are the dangers the backcountry brings. Some don't care to know, or learn, how to minimise their risk. Some never will. In today's world it is hard to believe that with all the information out there people could be totally ignorant of the dangers. People are more aware today of the dangers in the backcountry, and still some cannot or will not take the time out of their sport to take a course to help them make better decisions to keep them safer and perhaps alive.

Educating Snowmobilers

An article for educators

Darcy Svederus; SnowTec Services, Alberta Canada

During the ISSW in Big Sky in Oct. it became apparent that some of the delegates have a problem with Snowmobilers, Snowmachiners or as I say Sledheads. I have been to the past 3 ISSW's and have never felt that I didn't belong until the first session Monday morning. I would like to thank Jill Fredston for her comments as chair during this session. Yes I'm a Sledder and have been for 30+ yrs, Mountain riding for 14yrs and Teaching Avalanche Awareness to other sledders for 8yrs. So yes I've done everything wrong in the past but hopefully I can make more informed and smarter decisions tomorrow.

This article will not answer everyone's questions but will hopefully create a little insight into how we address this group of backcountry users - SLEDDERS.

As educators we have a tough time with this group mainly because we don't understand the sport. What is your political motivation towards these people? If it's negative do you think that they won't pick up on it and make things worse. Act as **professionals** and you will gain their trust

Always remember there are no guarantees in the mountains. No matter what your chosen sport don't be so arrogant to think bad things won't happen to you in the mountains. If you play in these places long enough it will happen. Everyone generally is concerned about AVALANCHES but there are other concerns as well. You are far from home and help and sometimes something breaks, or someone in your group sustains an injury. You must be prepared to handle anything Mother Nature, or outside sources, may send your way.

Those of us that have been doing this for some years have seen the people that we know have no business being in the backcountry mainly because they're so ill prepared, and sometimes it seems like we see it too often. Is it that they are lacking the common sense chromosome or is it something else?

Should we expect more??

We can all sit back and think of all the stupid things we've done in the past and gotten away with. We have all learned from our mistakes and sometimes learned very well or at an extreme price. What we see people doing now could be and sometimes is what we have done ourselves. Don't expect more from others than you did from yourself at a different point in your life.

Advancement in technology, survival gear, outerwear, horsepower, and reliability of equipment have put "back then" and "now" on different levels. So yes I do believe we should expect more today in many respects. Information is more readily available than it has ever been.

People

Everything I've talked about so far is completely generic it doesn't matter what sport you choose it's strictly people problems. As long as there are people on earth there will be problems with people. Yes I'm talking of all the animosity towards certain groups and Sledgers and Boarders seem to be getting the brunt of it right now.

I'm a snowmobiler or sledder and yes I've been called a lot of different things, and always for someone else's actions. It doesn't matter what sport you do, you will always be judged on what other people see at the worst possible times.

and respect through your respect for them. These people will take what we teach them at a course and adapt it to their sport. Be sure what you teach can be adapted

Humans tend to be reactive to problems instead of proactive

People have been riding sleds for over 40 yrs now but it's just been in the past 15 yrs that we see a trend start to appear with avalanche involvements. Why the change? All as we have to look at is the machine; older sleds had poor traction, poor suspension and overall poor reliability. We used to have a hard time even on flat land that if you went out, you were not certain you would get back home. The manufactures have come a long way. Long travel suspension, long tracks with 2-inch paddles, reliable as most cars. We used to sit on top of certain plateaus and dream of going into certain areas (no mans land) inaccessible because of our sleds. Today if you want to go the possibilities are endless. So as we can see the possibilities for problems are also endless.

We already know that the sled will take us where we want to go. Never asking if we should be there. If you take a few seasoned mountain riders and put them on the newer sleds the places they can go are truly astounding. For some of us down right scary. Some of us might think what they are doing is down right careless and they shouldn't be doing it. Most of the times we just need to explain that with a little modification to their riding style that they can do things a lot safer. Even if they're doing 5 things wrong if we can help them and make it only 4 we've cut their risk. That is what we are doing **right**.

Risk management

Many groups will have lunch in a terrain trap while watching friends highmark a windloaded slope 2-3 or 4 at a time just after a storm. Makes the hair on your neck stand up right. **Heres the kicker, no mater what we say they will continue to do this.** I've seen some large groups so #1 get the people at the bottom of the hill or in the terrain trap into a safer area. Explain why and always use a worst case scenario. #2 Highmarking is part of the deal so don't tell them not to do it, but do it smarter, safer 1 at a time, only expose 1 person to danger at a time while all other eyes in the group are watching. If someone gets stuck (this happens a lot) while on the slope

The modern day snowmobile has been around for more than 40 years and the sport is growing every year. It's not going to go away. What good has it done for Ski resorts, Avalanche pros accessing remote sites quickly, skiers and boarders are using it to access the alpine quicker? Just to name a few.

There have been problems in the past and they will continue in the future. We must remember that it is the people and not the sport, whether it be a Boarder, Skier, Climber, Sledder, Heli-skier, Snowshoer or somebody else. Some people would be idiots no matter what sport they choose to partake of. Forget that Boarder or Sledder that did something that bugged you yesterday. Don't take it out on a different group today. They will be the ones that get you out of a bind later. There are so many GOOD people in the world I think we should focus on that and not let the problems with some people consume our thoughts and darken our vision of other outdoor enthusiasts.

Safety or an Excuse?

We have heard all the all the excuses. I don't need all that gear or education if I get in trouble there is always search and rescue, All that gear will weigh me down, it costs too much, I don't have the time. The list is endless.

Avalanche beacons have really appeared in the sport of Snowmobiling in a short period of time and the manufacturers of these units should be commended for this. However, some of the people that bought them did so for all the wrong reasons.

1. My wife saw a show and told me that before I ride in the mountains again I need one.
2. It's an Avalanche detector and it beeps if the snow is unstable.
3. I can put it in my sled and find it if it's buried.

For some people it's just a false sense of security

When does peer pressure end - 40, 60, ever?? People pushing people will get us into more trouble in the backcountry. It's time to start pushing back.

there on their own. They have their gear get out the shovel and start digging out. #3 Windward, Leeward. The one that has the most snow is where you will find them. Trees, Rocks, convex rolls are nothing more than targets to get up and around. We now the dangers tell them too. #4 Wait after a storm (NEVER) someone else will get all the fresh snow and you'll be riding on someone else's tracks.

Keep at least 1 person in the group in visual contact at all times. The person in the front is responsible for keeping pace so the person behind doesn't lag behind. No exceptions, that person behind you will save your butt if things break loose.

Most are afraid of burial but what if there is an injury are they prepared to handle emergencies. Very few carry first aid /survival gear.

Most sledders have to trailer to the trailhead and sometimes this can be quite a distance so the trailhead is not the place to check transceivers, if someone forgot theirs or batteries or whatever. You can not give this an opportunity to happen. Have the group check there gear before they leave home of the hotel. I knew a person that this happened to. He forgot his transceiver in the Hotel, later in the day he was buried under less than 2 ft of snow, alive and uninjured when the motion stopped. The body was recovered the next day. Another instance where one lady with a transceiver was buried the person that forgot his was on the surface. The clock is ticking, luckily there was a well-equipped group that was close by and came over. Did a quick search and a live recovery.

Always park **beside** never in front or behind another sled, if you need to get away quickly you don't want a traffic jam. One other thing when your stopped always turn the key **on** and have the **kill switch up** so one pull and your ready to go, in a panic situation you may forget to do this, so you do it when you shut it off.

The safest routes are a tough call on a sled: Dense timber, Ridge tops or the avalanche path or chute to the top. For a sled there is only one choice and it's the most dangerous one so if they're going to go do it as safe as possible and one at a time.

I urge anyone that is dealing with sledders to get a copy of (Sledding in Avalanche Terrain) by Bruce Jamieson and myself.

Incident Updates for 2000-2001

Switzerland, Compiled by Frank Tschirky; SLF, Davos

16 people (as of February 13, 2001) - 3 out-of-bounds skiers, 1 out-of-bounds snowboarder, 1 helicopter skier, 1 climber, 7 backcountry skiers, 1 icefall climber, 2 rescuers

Cantons: UR = Uri, VS = Valais, GR = Grisons, BE = Berne, SZ = Schwyz, TI = Ticino

Date	Location	Canton	Activity	Description	Fatalities
11/11/00	ski resort of Gemsstock, Andermatt	UR	4 people out-of-bounds (skiers and snowboarders)	3 caught, 2 partly buried 1 injured, 1 person dead	1
11/12/0	Pte des Grands, Trient	VS	3 helicopter skiers	1 person caught and completely buried; ski visible on the avalanche debris (burial time: just 7 minutes!)	1
1/13/01	Arête des Ombrintses, Chandolin	VS	1 out-of-bounds snowboarder	1 person caught, completely buried (burial depth: 200 cm); found by an avalanche dog; died in the hospital"	1
1/13/01	Piz Padella, Celerina	GR	1 climber (solo) with snow shoes	"1 person caught, completely buried; missing on 16.01.01; found on 17.01.01 (by transceiver search with a helicopter)"	1
1/16/01	Täschehorn, Setzehorn, Blitzingen	VS	"1 backcountry skier (solo) descending"	"1 person caught, completely buried; small burial depth, ski-pole visible; missing and found on 17.01.01; big air-pocket"	1
1/28/01	Mittaghorn, Stiereberg, Gsteig	BE	"3 backcountry skier ascending"	"3 people caught, 2 people partly buried, not injured; 1 person completely buried (burial depth: 85 cm, burial time: 45 minutes), found by transceiver search, died in hospital"	1
2/3/01	Eisfälle Plat de la Lé, Zinal, Ayer	VS	6 icefall climber	"1 person caught and completely buried; found by rescue team one day later"	1
2/3/01	Eisfälle Plat de la Lé, Zinal, Ayer	VS	6 rescuer	"6 people caught by a second avalanche when searching the buried icefall climber; 3 people partly buried, 3 people completely buried; 4 people not injured, 2 people killed"	2

Date	Location	Canton	Activity	Description	Fatalities
2/4/01	Rinderhorn, Leukerbad	VS	"2 backcountry skier ascending"	"2 people caught, 1 person partly buried, not injured; 1 person completely buried, found by transceiver search through companions"	1
2/4/01	Forstberg, Chäseren, Oberiberg	SZ	"1 backcountry skier (solo) ascending"	"1 person caught, completely buried (burial depth: 150 cm); found by transceiver search through rescue team"	1
2/6/01	"Tête de Balme, Skigebiet Le Tour, Trient"	VS	9 out-of-bounds skier	"4 people caught and completely buried; 1 person not injured, 1 person injured, 2 people killed (depth of 1 person: 450 cm)"	2
2/11/01	Pizzo Rotondo, Bedretto	TI	3 backcountry skier	"3 people caught by a huge avalanche and completely buried; last missing person found on 13.02.01"	3

Franks' comments as of Feb 14, 2001 -

In the last issue I have written: "As you see we don't have many fatalities in the Swiss Alps until now. In the northern parts of the Alps we have very little snow (far below the average). In contrast to these regions in the southern parts and along the highest range between Zermatt and Bernina there is plenty of snow (much more than the average) and a quite solide snow cover. Most of the time we had unusual high temperatures (all storms between October and now came from the South, which is very unusual). These are probably reasons for the small avalanche activity in Switzerland in the month of December. At the moment some weak layers are growing at the surface of the snow cover. So we fear to have a critical situation after the next biger snow fall."

Since then the weather conditions have not changed a lot. In January and in February (until last weekend) we had several more storms from the south with the same results as before: very often unusual high temperatures, especially in the northern parts of the Alps, still little snow (between 30 and 70 % of the average) in the northern parts and a lot of snow in the southern parts and along the principal range of the Alps between Zermatt and Bernina (180 to 250 % of the average). In some places in the northern Ticino and in the upper Engadine valley (Maloja, St.Moritz, Pontresina) the total snow height reached the highest level in 50 years, since the avalanche winter in January and February of 1951. Now the general weather situation seems to be changing. We hope for that very much because in some places the avalanche defense structures are completely full with snow (for example in Pontresina). Another storm with heavy snowfalls from the south could result in a disaster.

Last time I have written: "At the moment some weak layers are growing at the surface of the snow cover. So we fear to have a critical situation after the next bigger snowfall." Unfortunately we got that situation with a lot of accidents and avalanche victims. The main problems of the last 2 weekends (with a total of 8 fatalities) were: good weather and snow conditions just shortly after heavy snowfalls with heavy winds, thousands of ski tourers, off-piste-skiers and snowboarders etc. in free terrain, critical weak layers in the snowcover. At the moment the situation seems to be much better and we are quite optimistic for the future (depending of the weather). The weather forecast for the coming days is good and the avalanche danger is on level 2 (moderate) with a tendency to level 1 (low).

We have had 2 very bad accidents (03.02. Icefalls Zinal and 11.02. Pizzo Rotondo) with a total of 6 fatalities. In Zinal two professional rescuers and mountain guides lost their lives when they searched for a buried icefall climber who also died. A second avalanche caught the whole rescue team, at just the moment, when they turned off their beacons, to have better possibilities to search with a RECCO-receiver. It has been a long time ago in Switzerland since the last case when rescuers lost their lives in avalanches.

Last weekend a very huge avalanche caught and killed 3 skitourers at Pizzo Rotondo. One problem there was that we were on level 2 (moderate) danger for this region with our avalanche bulletin and this was probably not entirely accurate. And so we are examining some critical questions.

Frank Tsirchy; SLF, Davos February 13, 2001

**Scotland, Compiled by Blyth Wright Co-ordinator SAIS
SportScotland Avalanche Information Service**

Date	Time	Involved	Buried	Dead	Injured	OK	Activity	Location
25-Nov-00	11:00	4	0	0	0	4	Climbers	North Cairngorms
28-Dec-00	14:10	2	1	0	0	2	Walkers	North Cairngorms
03-Jan-01		3	0	0	0	3	Climbers	Lochaber -Ben Nevis
13-Jan-01		2	0	0	0	2	Walkers	North Cairngorms
14-Jan-01	14:30	1	0	0	0	1	Climber	Angus Glens
16-Jan-01	12:00	6	0	0	0	6	Walkers	North Cairngorms
16-Jan-01		1	0	0	0	1	Ski tourer	North Cairngorms
21-Jan-01	12:30	1	0	0	0	1	Walker	South Cairngorms
21-Jan-01	12:00	2	0	0	2	0	Walkers	Glencoe
21-Jan-01		2	1	2	0	0	Climbers	Angus Glens
10-Feb-01	11:20	1	0	0	0	1	Ski tourer	North Cairngorms
10-Feb-01		2	0	0	1	1	Climber	Torridon
10-Feb-01		1	0	0	0	1	Climber	Black Mount
10-Feb-01	13:00	2	0	0	0	2	Walkers	Tyndrum
11-Feb-01	14:05	3	1	0	1	2	Walkers	Glencoe
Totals:		33	3	2	4	27		

US Incidents, Compiled by Jim Frankenfield

16 people (as of February 13, 2001) - 1 hunter, 2 snowboarders, 3 skiers, 7 snowmobilers, 1 snowshoer, 2 hikers

Fatalities	Date	State	Vicinity	Activity	Description
1	Feb 7	Wyoming	Jackson	Skiing	went over cliff band
2	Feb 3	Alaska	Eureka	Snowmobiling	very large slide, deep burial
1	Jan 29	Washington	Lk Wenatchee	Snowshoeing	surface hoar over ice, low elev.
1	Jan 17	Montana	Jackson	Snowmobiling	equipped with safety gear
2	Dec 31	Montana	Bozeman	Hiking	narrow funnel path, 1600' vertical
1	Dec 29	Colorado	Cameron Pass	Snowboarding	600' vertical, buried 1 ft deep
1	Dec 25	Wyoming	Teton County	Skiing	3rd of 3 skiers to cross the path
2	Dec 17	Montana	Marias Pass	Snowmobile	snowmachine stuck, terrain trap
1	Dec 14	Utah	Willard Peak	Snowmobile	stuck in drift on a road, in path(s)
1	Dec 09	Alaska	Cantwell	Snowmobile	highmarking, machine just freed
1	Dec 09	Wyoming	Teton Pass	Skiing	terrain trap, skiing alone
1	Dec 01	Wyoming	Teton Pass	Snowboard	buried 1 hr 5-6 ft deep
1	Nov 27	Wyoming	Near Cody	Hunting	terrain trap (cliffs)
16	Total US Fatalities				

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Franz Kröll is with ORTOVOX sportartikel gmbh in Germany, <http://www.ortovox.com/>

Ted Steiner is the new Executive Director of the Glacier Country Avalanche Center which serves Northwestern Montana. Their website is <http://www.glacieravalanche.org/>

Walter Stefan Würtl is a student at the University of Innsbruck in Austria.

Darcy Svederus (Snowtec Services) has been snowmobiling since his teens and has become an avid mountain rider. He has been involved with many of the clubs, including the executive of the Alberta Snowmobile Association. In 1994 he became the safety director. Darcy teaches recreational avalanche courses for snowmobilers as well as a snowmobile safety course which he developed.

Lori Zacaruk is involved in avalanche education for snowmobilers through Zacs Tracks, located in Black Diamond, AB (Canada)

Blyth Wright is the co-ordinator for the SportScotland Avalanche Information Center (SAIS). Their website, <http://www.sais.gov.uk/>, has the distinction of being the first on the net. It is the only known avalanche related website with a slightly longer history than the CSAC.

Frank Tschirky is an Avalanche Forecaster and Mountain Guide who works in the Avalanche Warning and Risk Management section of the Swiss Federal Institute for Snow and Avalanche Research in Davos, <http://www.slf.ch/>

Dr. Steven A. Reinfurt is a Professional Member of the American Mountain Guides Association (AMGA), *American Association of Avalanche Professionals (AAAP, now AAA)*, ski industry consultant in U.S. and Europe, Certified Senior NSPS professional Alpine and Nordic patroller and advanced avalanche/mountaineering instructor trainer. He works extensively throughout the Alps in avalanche control & education, ski area risk management, search and rescue, and was co-responsible for creating the *AAAP European Section* jointly with the *Innsbruck Institute for Avalanche Research*.

Jim Frankenfield is the Executive Director and founder of the CSAC and is responsible for assembly and distribution of the newsletter. In addition to running www.csac.org he guides and teaches recreational avalanche courses, specializing in custom arrangements and small group/class sizes. His avalanche-related background is posted on his professional services website, <http://www.mountain-guiding.com/avalanche/>